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WHAT IS CLAIMED IS:

1. A drill pipe for an oil or gas well comprising:  
5 a generally cylindrical hollow drill pipe having an inner diameter;  
an outer insulative coating attached to the inner diameter of the drill pipe;  
a conductive coating attached to the outer  
10 insulative coating; and  
an inner insulative coating attached to the conductive coating, wherein the outer insulative coating, the conductive coating and the inner insulative coating together define an insulated electrical pathway from an upper end of  
15 the drill pipe to a lower end of the drill pipe.

2. The drill pipe of claim 1, further comprising a second conductive coating attached to the inner insulative coating and a second inner insulative coating attached to the  
20 second conductive coating, such that the inner insulative coating, the second conductive coating and the second inner insulative coating define a second insulated electrical pathway from the upper end of the drill pipe to the lower end of the drill pipe.

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3. The drill pipe of claim 1, further comprising a plurality of conductive coatings attached to the inner insulative coating, wherein each of the plurality of conductive coatings comprises an inner insulating coating and  
30 an outer insulating coating, such that each of the plurality of conductive coatings forms an insulated electrical pathway that extends from the upper end of the drill pipe to the lower end of the drill pipe.

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4. A drill string for an oil or gas well comprising:

a plurality of generally cylindrical hollow drill pipes, wherein each drill pipe mates with a corresponding adjacent drill pipe to form the drill string and wherein each drill pipe comprises an inner diameter;

an outer insulative coating attached to the inner diameter of each drill pipe;

a conductive coating attached to the outer insulative coating of each drill pipe;

an inner insulative coating attached to the conductive coating of each drill pipe, wherein for each drill pipe the outer insulative coating, the conductive coating and the inner insulative coating together define an insulated electrical pathway from an upper end of the drill pipe to a lower end of the drill pipe; and

a connector that electrically connects the insulated electrical pathway of each drill pipe to the insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish an insulated electrical pathway from an upper end of the drill string to a lower end of the drill string.

5. The drill string of claim 4, further comprising a second conductive coating attached to the inner insulative coating of each drill pipe and a second inner insulative coating attached to the second conductive coating of each drill pipe, such that the inner insulative coating, the second conductive coating and the second inner insulative coating of each drill pipe define a second insulated electrical pathway from the upper end of each drill pipe to the lower end of each drill pipe, and wherein the connector further electrically connects the second insulated electrical pathway of each drill pipe to the second insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to

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establish a second insulated electrical pathway from the upper end of the drill string to the lower end of the drill string.

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6. The drill string of claim 4, further comprising a plurality of conductive coatings for each drill pipe attached to the inner insulative coating of each drill pipe, wherein each of the plurality of conductive coatings comprises an inner insulating coating and an outer insulating coating, such that each of the plurality of conductive coatings forms an insulated electrical pathway that extends from the upper end of each drill pipe to the lower end of each drill pipe, and wherein the connector further electrically connects a first and each subsequent one of the plurality of conductive coatings of each drill pipe to the first and each subsequent one, respectively, of the plurality of conductive coatings of the corresponding adjacent drill pipe of each drill pipe to establish a plurality of insulated electrical pathways from the upper end of the drill string to the lower end of the drill string.

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7. A drill string for an oil or gas well comprising:  
a plurality of generally cylindrical hollow drill pipes, wherein each drill pipe mates with a corresponding adjacent drill pipe to form the drill string, and wherein each drill pipe comprises an inner diameter, an upper annular recess at an upper end of each drill pipe and a lower annular recess at a lower end of each drill pipe;  
an outer insulative coating attached to the inner diameter, the upper annular recess and the lower annular recess of each drill pipe;  
an upper and a lower conductive sleeve attached to the outer insulative coating in the upper and lower annular recess, respectively, of each drill pipe;

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a conductive coating attached to the outer insulative coating and to the upper and lower conductive sleeves to establish an electrical pathway from the upper end to the lower end of each drill pipe;

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an inner insulative coating attached to the conductive coating of each drill pipe, to insulate the electrical pathway of each drill pipe; and

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a connector that electrically connects the insulated electrical pathway of each drill pipe to the insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish an insulated electrical pathway from an upper end of the drill string to a lower end of the drill string.

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8. The drill string of claim 7, wherein the connector comprises a conducting material having an upper conducting contact that forms an electrical connection with the lower conducting sleeve of each drill pipe and a lower conducting contact that forms an electrical connection with the upper conducting sleeve of the corresponding adjacent drill pipe of each drill pipe.

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9. The drill string of claim 8, wherein the upper and lower conducting contacts of the connector are elastic.

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10. The drill string of claim 8, wherein the upper and lower conducting contacts protrude from a connector body that is comprised of an insulator and a remainder of the connector conducting material is embedded in the insulated connector body.

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11. The drill string of claim 8, wherein the connector comprises an upper annular groove disposed above the upper conducting contact and a lower annular groove disposed below

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the lower conducting contact, wherein the upper annular groove comprises an o-ring that seals off fluids from above the connection of the connector upper conducting contact and the drill pipe lower conducting sleeve and the lower annular groove comprises an o-ring that seals off fluids from below the connection of the connector lower conducting contact and the drill pipe upper conducting sleeve.

10           12. The drill string of claim 7, wherein the outer insulative coating, the conductive coating, and the inner insulative coating are each .006 inches to .030 inches thick.

15           13. The drill string of claim 7, wherein the connector is supported between the lower end of each drill pipe and the upper end of the corresponding adjacent drill pipe of each drill by use of a protruding shoulder of the connector that mates with a shoulder in the upper end of the corresponding adjacent drill pipe of each drill.

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14. The drill string of claim 7, wherein each drill pipe further comprises:

25           a second upper annular recess at an upper end of each drill pipe and a second lower annular recess at a lower end of each drill pipe, wherein the outer insulative coating, the conductive coating and the inner insulative coating each extend into both the second upper annular recess and the second lower annular recess;

30           a second upper and a second lower conductive sleeve attached to the inner insulative coating in the second upper and the second lower annular recess, respectively, of each drill pipe;

35           a second conductive coating attached to the inner insulative coating and to the upper and lower conductive

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sleeves to establish a second electrical pathway from the upper end to the lower end of each drill pipe; and

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a second inner insulative coating attached to the second conductive coating of each drill pipe, to insulate the second electrical pathway of each drill pipe, wherein the connector electrically connects the insulated second electrical pathway of each drill pipe to the insulated second electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish a second insulated electrical pathway from the upper end of the drill string to the lower end of the drill string.

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15. The drill string of claim 7, wherein each drill pipe further comprises:

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a plurality of upper annular recesses at an upper end of each drill pipe and a plurality of lower annular recesses at a lower end of each drill pipe;

a plurality of upper and lower conductive sleeves, wherein each upper and lower annular recess comprises one of the plurality of upper and lower conductive sleeves, respectively, attached thereto;

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a plurality of conductive coatings, wherein each of the plurality of conductive coatings comprises an inner insulative coating and an outer insulative coating and wherein each of the plurality of conductive coatings electrically connects one of the plurality of upper conductive sleeves to one of the plurality of lower conductive sleeves of each drill pipe to establish a plurality of electrical pathways from the upper end to the lower end of each drill pipe; and

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wherein the connector electrically connects each of the plurality of insulated electrical pathways of each drill pipe to a corresponding one of the plurality of insulated electrical pathways of the corresponding adjacent drill pipe of each drill pipe to establish a plurality of insulated

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electrical pathways from the upper end of the drill string to the lower end of the drill string.

5           16. A method of communicating to downhole oil or gas well equipment comprising:

          providing a generally cylindrical hollow drill pipe having an inner diameter;

          attaching an outer insulative coating to the inner  
10 diameter of the drill pipe;

          attaching a conductive coating to the outer insulative coating; and

          attaching an inner insulative coating to the conductive coating, such that the outer insulative coating,  
15 the conductive coating and the inner insulative coating together define an insulated electrical pathway from an upper end of the drill pipe to a lower end of the drill pipe.

          17. The method of claim 16, further comprising attaching  
20 a second conductive coating to the inner insulative coating and attaching a second inner insulative coating to the second conductive coating, such that the inner insulative coating, the second conductive coating and the second inner insulative coating define a second insulated electrical pathway from the  
25 upper end of the drill pipe to the lower end of the drill pipe.

          18. The method of claim 16, further comprising attaching  
30 a plurality of conductive coatings to the inner insulative coating, wherein each of the plurality of conductive coatings comprises an inner insulating coating and an outer insulating coating, such that each of the plurality of conductive coatings forms an insulated electrical pathway that extends from the upper end of the drill pipe to the lower end of the  
35 drill pipe.

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19. A method of communicating to downhole oil or gas well equipment comprising:

5 providing a plurality of generally cylindrical hollow drill pipes wherein each drill pipe comprises an inner diameter;

        mating each drill pipe with a corresponding adjacent drill pipe to form a drill string;

10 attaching an outer insulative coating to the inner diameter of each drill pipe;

        attaching a conductive coating to the outer insulative coating of each drill pipe;

15 attaching an inner insulative coating to the conductive coating of each drill pipe, wherein for each drill pipe the outer insulative coating, the conductive coating and the inner insulative coating together define an insulated electrical pathway from an upper end of the drill pipe to a lower end of the drill pipe; and

20 providing a connector that electrically connects the insulated electrical pathway of each drill pipe to the insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish an insulated electrical pathway from an upper end of the drill string to a lower end of the drill string.

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20. The method of claim 19, further comprising attaching a second conductive coating to the inner insulative coating of each drill pipe and attaching a second inner insulative coating to the second conductive coating of each drill pipe, such that the inner insulative coating, the second conductive coating and the second inner insulative coating of each drill pipe define a second insulated electrical pathway from the upper end of each drill pipe to the lower end of each drill pipe, and wherein the connector further electrically connects  
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the second insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish a second insulated electrical pathway from the upper end of the drill string to the lower end of the drill string.

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21. The method of claim 19, further comprising attaching a plurality of conductive coatings for each drill pipe to the inner insulative coating of each drill pipe, wherein each of the plurality of conductive coatings comprises an inner insulating coating and an outer insulating coating, such that each of the plurality of conductive coatings forms an insulated electrical pathway that extends from the upper end of each drill pipe to the lower end of each drill pipe, and wherein the connector further electrically connects a first and each subsequent one of the plurality of conductive coatings of each drill pipe to the first and each subsequent one, respectively, of the plurality of conductive coatings of the corresponding adjacent drill pipe of each drill pipe to establish a plurality of insulated electrical pathways from the upper end of the drill string to the lower end of the drill string.

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22. A method of communicating to downhole oil or gas well equipment comprising:

providing a plurality of generally cylindrical hollow drill pipes, wherein each drill pipe comprises an inner diameter;

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mating each drill pipe with a corresponding adjacent drill pipe to form the drill string;

forming an upper annular recess at an upper end of each drill pipe and a lower annular recess at a lower end of each drill pipe;

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attaching an outer insulative coating to the inner diameter, the upper annular recess and the lower annular recess of each drill pipe;

5 attaching an upper and a lower conductive sleeve to the outer insulative coating in the upper and lower annular recess, respectively, of each drill pipe;

10 attaching a conductive coating to the outer insulative coating and to the upper and lower conductive sleeves to establish an electrical pathway from the upper end to the lower end of each drill pipe;

attaching an inner insulative coating to the conductive coating of each drill pipe, to insulate the electrical pathway of each drill pipe; and

15 providing a connector that electrically connects the insulated electrical pathway of each drill pipe to the insulated electrical pathway of the corresponding adjacent drill pipe of each drill pipe to establish an insulated electrical pathway from an upper end of the drill string to a  
20 lower end of the drill string.

23. The method of claim 22, further comprising providing the connector with a conducting material having an upper  
25 conducting contact that forms an electrical connection with the lower conducting sleeve of each drill pipe and a lower conducting contact that forms an electrical connection with the upper conducting sleeve of the corresponding adjacent drill pipe of each drill pipe.

30 24. The method of claim 23, further comprising forming the upper and lower conducting contacts of the connector from an elastic material.

35 25. The method of claim 23, further comprising forming a body of the connector from an insulating material, protruding

1 the upper and lower conducting contacts from the insulated  
connector body, and embedding a remainder of the connector  
conducting material in the insulated connector body.

5 26. The method of claim 23, further comprising:  
forming an upper annular groove in the connector at  
a position above the upper conducting contact;  
forming a lower annular groove in the connector at a  
10 position below the lower conducting contact;  
inserting an o-ring in the upper annular groove to  
seal off fluids from above the connection of the connector  
upper conducting contact and the drill pipe lower conducting  
sleeve; and  
15 inserting an o-ring in the lower annular groove to  
seal off fluids from below the connection of the connector  
lower conducting contact and the drill pipe upper conducting  
sleeve.

20 27. The method of claim 22, further comprising forming  
the outer insulative coating, the conductive coating, and the  
inner insulative coating to a thickness of .006 inches to .030  
inches.

25 28. The method of claim 22, further comprising  
supporting the connector between the lower end of each drill  
pipe and the upper end of the corresponding adjacent drill  
pipe of each drill by mating a protruding shoulder of the  
connector with a shoulder in the upper end of the  
30 corresponding adjacent drill pipe of each drill.

29. The method of claim 22, further comprising:  
forming a second upper annular recess at an upper  
end of each drill pipe and a second lower annular recess at a  
35 lower end of each drill pipe;

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attaching the outer insulative coating, the  
conductive coating and the inner insulative coating to each  
drill pipe such that they each extend into both the second  
upper annular recess and the second lower annular recess;

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attaching a second upper and a second lower  
conductive sleeve to the inner insulative coating in the  
second upper and the second lower annular recess,  
respectively, of each drill pipe;

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attaching a second conductive coating to the inner  
insulative coating and to the upper and lower conductive  
sleeves to establish a second electrical pathway from the  
upper end to the lower end of each drill pipe; and

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attaching a second inner insulative coating to the  
second conductive coating of each drill pipe, to insulate the  
second electrical pathway of each drill pipe, wherein the  
connector electrically connects the insulated second  
electrical pathway of each drill pipe to the insulated second  
electrical pathway of the corresponding adjacent drill pipe of  
each drill pipe to establish a second insulated electrical  
pathway from the upper end of the drill string to the lower  
end of the drill string.

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30. The method of claim 22, wherein each drill pipe  
further comprises:

forming a plurality of upper annular recesses at an  
upper end of each drill pipe and a plurality of lower annular  
recesses at a lower end of each drill pipe;

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attaching a plurality of upper and lower conductive  
sleeves, respectively, to a corresponding one of the upper and  
lower annular recesses;

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electrically connecting a plurality of conductive  
coatings to one of the one of the plurality of upper  
conductive sleeves and to one of the plurality of lower  
conductive sleeves of each drill pipe to establish a plurality

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of electrical pathways from the upper end to the lower end of each drill pipe, wherein each of the plurality of conductive coatings comprises an inner insulative coating and an outer insulative coating; and

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wherein the connector electrically connects each of the plurality of insulated electrical pathways of each drill pipe to a corresponding one of the plurality of insulated electrical pathways of the corresponding adjacent drill pipe of each drill pipe to establish a plurality of insulated electrical pathways from the upper end of the drill string to the lower end of the drill string.

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31. A drill pipe for an oil or gas well comprising:  
a generally cylindrical hollow drill pipe having a length; and

a conductive coating connected to the drill pipe to define an electrical pathway that extends along at least a portion of the length of the drill pipe.

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32. The drill pipe of claim 31, wherein the conductive coating is insulated.

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33. The drill pipe of claim 31, wherein the conductive coating is surrounded by insulative coatings.

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34. The drill pipe of claim 31, wherein the conductive coating extends from an upper end of the drill pipe to a lower end of the drill pipe.

35. The drill pipe of claim 31, wherein the conductive coating extends along the length of the drill pipe.

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36. The drill pipe of claim 31, further comprising a second conductive coating connected to the drill pipe to

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define a second electrical pathway that extends along at least a portion of the length of the drill pipe.

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37. The drill pipe of claim 36, wherein the second conductive coating is applied over said conductive coating.

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38. The drill pipe of claim 37, wherein the second conductive coating is insulated from said conductive coating.

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39. The drill pipe of claim 31, further comprising a plurality of conductive coatings connected to the drill pipe to define a plurality of electrical pathways that each extend along at least a portion of the length of the drill pipe.

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40. The drill pipe of claim 39, wherein each successive conductive coating in the plurality of conductive coatings is applied over an adjacent one of the plurality of conductive coatings.

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41. The drill pipe of claim 40, wherein each conductive coating in the plurality of conductive coatings is insulated from said adjacent one of the plurality of conductive coatings.

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42. A method of communicating to downhole oil or gas well equipment comprising:

providing a generally cylindrical hollow drill pipe having a length; and

applying a conductive coating on the drill pipe to define an electrical pathway that extends along at least a portion of the length of the drill pipe.

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43. The method of claim 32, further comprising insulating the conductive coating.

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44. The method of claim 32, further comprising surrounding the conductive coating with insulative coatings.

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45. The method of claim 32, wherein the conductive coating extends from an upper end of the drill pipe to a lower end of the drill pipe.

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46. The method of claim 32, wherein the conductive coating extends along the length of the drill pipe.

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47. The method of claim 32, further comprising applying a second conductive coating on the drill pipe to define a second electrical pathway that extends along at least a portion of the length of the drill pipe.

48. The method of claim 47, wherein the second conductive coating is applied over said conductive coating.

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49. The method of claim 48, further comprising insulating the second conductive coating from said conductive coating.

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50. The method of claim 32, further comprising applying a plurality of conductive coatings on the drill pipe to define a plurality of electrical pathways that each extend along at least a portion of the length of the drill pipe.

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51. The method of claim 50, wherein each successive conductive coating in the plurality of conductive coatings is applied over an adjacent one of the plurality of conductive coatings.

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52. The method of claim 51, wherein each conductive coating in the plurality of conductive coatings is insulated

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from said adjacent one of the plurality of conductive  
coatings.

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